CLAIMS:

1. A three-dimensional (3D) video coding method for the compression of a bitstream corresponding to an original video sequence that has been divided into successive groups of frames (GOFs) the size of which is $N = 2^n$ with n being an integer, these GOFs being themselves subdivided into successive couples of frames (COFs), said coding method comprising the following steps, applied to each successive GOF of the sequence:

a) a spatio-temporal analysis step, performed with a given number of levels at most equal to n and leading to a spatio-temporal multiresolution decomposition of the current GOF into low and high frequency temporal subbands, said step itself comprising:

- a motion estimation sub-step;
- based on said motion estimation, a motion compensated temporal filtering sub-step, performed on each of the 2^{n-1} COFs of the current GOF;
- a spatial analysis sub-step, performed on the subbands resulting from said temporal filtering sub-step;

b) an encoding step, said step itself comprising:

- an entropy coding sub-step, performed on said low and high frequency temporal subbands resulting from the spatio-temporal analysis step and on motion vectors obtained by means of said motion estimation step;
- an arithmetic coding sub-step, applied to the coded sequence thus obtained and delivering an embedded coded bitstream;

said coding method being further characterized in that, when said temporal filtering sub-step comprises (n-1) decomposition levels so that the final temporal decomposition level that would have led to a single low-frequency subband is omitted, the spatio-temporal analysis and encoding steps are performed according to the following rules:

(a) each current input GOF is splitted into two new GOFs with half the original size and half the number of COFs, said new GOFs being independent and comprising respectively the 2^{n-1} first frames and the 2^{n-1} last ones of said original input GOF;

(b) in each of these two new GOFs, a complete spatio-temporal multiresolution decomposition with (n-1) levels is performed down to the last low frequency temporal subband in order to get only one final approximation subband for each of said new GOFs;

(c) a modified 3D-SPIHT scanning is applied consecutively and independently on these two new GOFs, the spatio-temporal orientation trees used by said SPIHT scanning for defining the spatio-temporal relationships inside the hierarchical pyramid of the wavelet coefficients including now half the original number of subbands with respect to a spatio-temporal decomposition as conventionally performed on the original GOF.

2. A video coding device for the implementation of the three-dimensional video coding method according to claim 1, said device comprising:

(a) spatio-temporal analysis means applied to each successive GOF of the sequence with a given number of levels at most equal to n and leading to a spatio-temporal multiresolution decomposition of the current GOF into low and high frequency temporal subbands, said analysis means performing:

- a motion estimation sub-step;
- based on said motion estimation, a motion compensated temporal filtering sub-step, performed on each of the 2^{n-1} COFs of the current GOF;
- a spatial analysis sub-step, performed on the subbands resulting from said temporal filtering sub-step;

b) encoding means, themselves comprising:

- entropy coding means, applied to said low and high frequency temporal subbands resulting from the spatio-temporal analysis step and to motion vectors obtained by means of said motion estimation sub-step;
- arithmetic coding means, applied to the coded sequence thus obtained and delivering an embedded coded bitstream;

said video coding device being further characterized in that, when said temporal filtering sub-step comprises (n-1) decomposition levels so that the final temporal decomposition level that would have led to a single low-frequency subband is omitted, the spatio-temporal analysis and encoding means use the following rules:

(a) each current input GOF is splitted into two new GOFs with half the original size and half the number of COFs, said new GOFs being independent and comprising respectively the 2^{n-1} first frames and the 2^{n-1} last ones of said original input GOF;

(b) in each of these two new GOFs, a complete spatio-temporal multiresolution decomposition with (n-1) levels is performed down to the last low frequency temporal subband in order to get only one final approximation subband for each of said new GOFs;

(c) a modified 3D-SPIHT scanning is applied consecutively and independently on these two new GOFs, the spatio-temporal orientation trees used by said SPIHT scanning for defining the spatio-temporal relationships inside the hierarchical pyramid of the wavelet coefficients including now half the original number of subbands with respect to a spatio-temporal decomposition as conventionally performed on the original GOF.